

and in portions of Florida, Georgia, and in South Carolina was ample for the needs of the season, although somewhat less than the normal for the time and place. An abundance of rain fell on the Pacific coast. Heavy rains fell in southern California where drought has prevailed for the last three years. Snowfall was deficient in amount and not well distributed. At the close of the month the ground was covered with snow in New England, the Middle Atlantic States, except in southern New Jersey, Delaware, and the coast region of Maryland and Virginia. The ground was also covered in the lower Lake region, including Ohio; the upper Lake region, and throughout northern Indiana, Illinois, northeastern Iowa, Minnesota, and the northeastern portion of North Dakota. Snow covered the ground also in the mountain districts of Colorado, Wyoming, Montana, Nevada, California, Idaho, and northeastern Oregon.

The distribution of snowfall is shown by Chart IX, and the amount on the ground at the end of the month by Chart X.

Average precipitation and departure from the normal.

Districts.	Number of stations.	Average.		Departure.	
		Current month.	Percentage of normal.	Current month.	Accumulated since Jan. 1.
		Inches.		Inches.	Inches.
New England	10	2.47	61	-1.6	.....
Middle Atlantic.....	12	2.39	67	-1.2	.....
South Atlantic.....	10	2.84	67	-1.4	.....
Florida Peninsula.....	7	2.64	90	-0.3	.....
East Gulf.....	7	4.65	89	-0.6	.....
West Gulf.....	7	1.66	48	-1.8	.....
Ohio Valley and Tennessee.....	12	2.87	57	-1.8	.....
Lower Lake.....	8	2.05	77	-0.6	.....
Upper Lake.....	9	1.22	60	-0.8	.....
North Dakota.....	8	0.34	53	-0.3	.....
Upper Mississippi Valley.....	11	1.11	64	-0.6	.....
Missouri Valley.....	10	0.44	42	-0.6	.....
Northern Slope.....	7	0.23	37	-0.4	.....
Middle Slope.....	6	0.24	29	-0.6	.....
Southern Slope.....	6	0.25	24	-0.8	.....
Southern Plateau.....	15	1.17	100	0.0	.....
Middle Plateau.....	9	1.00	71	-0.4	.....
Northern Plateau.....	10	1.69	81	-0.4	.....
North Pacific.....	9	7.10	99	-0.1	.....
Middle Pacific.....	5	6.55	118	+1.0	.....
South Pacific.....	4	4.48	167	+1.8	.....

In Canada.—Professor Stupart says:

Precipitation was generally above average in the Northwest Territories, also in many portions of the Maritime Provinces, but elsewhere in Canada, except very locally, it was below average. The deficiency in parts of British Columbia amounted to from one and one-half to two and one-half inches, while in Quebec the mean was about an inch below the average. In Ontario it was as much as 2.7 inches below average at Kingston, and 1 inch below at Southampton. At the end of the month the ground was well covered with snow in nearly all portions of Canada, this being especially the case in the Qu'Appelle Valley, northern and eastern Ontario, the Province of Quebec, and the greater portion of the Maritime Provinces. Qu'Appelle reports 38 inches of snow on the ground; White River 24 inches; Clontarf and Ottawa, 30 inches; Montreal 26 inches; Quebec 25 inches; Father Point, 33 inches; Fredericton, 22 inches; Sussex and Point Le Preaux, 30 inches.

SLEET.

The following are the dates on which sleet fell in the respective States:

Alabama, 17. Arizona, 29. Arkansas, 9. California, 1, 2, 3, 4, 6, 8, 11, 12, 24, 25, 31. Colorado, 8, 9, 25. Connecticut, 7, 9, 10, 11, 12, 14, 15, 24. District of Columbia, 24. Georgia, 17, 26. Idaho, 6. Illinois, 9, 10, 11, 14, 17, 22, 23, 25, 26, 29, 30. Indiana, 9, 10, 11, 21, 23, 27, 29, 30, 31. Indian Territory, 9, 10, 30. Iowa, 6, 7, 9, 10, 16, 23, 24, 25, 26, 27, 29, 31. Kansas, 9, 25, 26. Kentucky, 25, 26, 27, 29. Maine, 9, 24, 26, 27. Maryland, 7, 18, 22, 24, 25. Massachusetts, 9, 10, 11, 12, 23, 24. Michigan, 6, 7, 8, 9, 10, 14, 15. Minnesota, 13, 15. Mississippi, 11, 30. Missouri, 7, 8, 9, 10, 11, 17, 22, 24, 25, 26. Nebraska, 24, 25, 26. Nevada, 24. New Hampshire, 8, 9, 12,

22, 24. New Jersey, 10, 13, 15, 18, 25. New Mexico, 9, 25, 27, 29. New York, 7, 9, 10, 11, 12, 13, 14, 15, 16, 19, 21. North Carolina, 2, 17, 18, 25, 26, 27, 29, 30. Ohio, 9, 11, 14, 23, 24, 25, 27, 29, 30. Oklahoma, 8, 9, 10. Oregon, 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 14, 22, 23, 24. South Dakota, 28. Tennessee, 17, 24, 26, 27, 30. Texas, 1, 10, 18, 19. Utah, 4, 5, 6, 7, 12, 21, 22. Vermont, 7, 8, 9, 10, 12, 22. Virginia, 24, 26, 27, 28. Washington, 2, 3, 4, 11, 21, 22, 24, 30. West Virginia, 7, 12, 24, 25, 30. Wisconsin, 6, 8, 9, 14, 23. Wyoming, 8.

HAIL.

The following are the dates on which hail fell in the respective States:

Arizona, 8, 28, 29. Arkansas, 23. California, 9, 11, 24, 31. Florida, 4. Kentucky, 23. Louisiana, 16. Missouri, 23. New Mexico, 29. Oregon, 1, 2, 4, 5, 6, 7, 8, 10, 11, 21, 23, 24. Pennsylvania, 7, 10, 11, 12, 18. South Carolina, 17, 27, 29.

SUNSHINE AND CLOUDINESS.

The distribution of sunshine is graphically shown on Chart VII, and the numerical values of average daylight cloudiness, both for individual stations and by geographical districts, appear in Table I.

The averages for the various districts, with departures from the normal, are shown in the table below:

Average cloudiness and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
New England	6.4	+0.6	Missouri Valley.....	4.2	-0.9
Middle Atlantic.....	5.9	+0.3	Northern Slope.....	4.6	0.0
South Atlantic.....	5.0	-0.3	Middle Slope.....	3.8	0.0
Florida Peninsula.....	4.2	-0.5	Southern Slope.....	4.9	+1.1
East Gulf.....	4.9	-0.7	Southern Plateau.....	3.5	+0.6
West Gulf.....	5.4	0.0	Middle Plateau.....	5.0	+0.2
Ohio Valley and Tennessee.....	6.2	-0.2	Northern Plateau.....	7.0	-0.3
Lower Lake.....	8.2	+0.7	North Pacific Coast.....	7.5	+0.4
Upper Lake.....	7.3	+0.5	Middle Pacific Coast.....	5.6	+0.5
North Dakota.....	4.3	-0.4	South Pacific Coast.....	5.0	+0.9
Upper Mississippi.....	5.0	-0.3			

HUMIDITY.

The averages by districts appear in the subjoined table:

Average relative humidity and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
New England	75	-1	Missouri Valley.....	68	-10
Middle Atlantic.....	74	-1	Northern Slope.....	71	+1
South Atlantic.....	74	-4	Middle Slope.....	68	-4
Florida Peninsula.....	78	-4	Southern Slope.....	54	-10
East Gulf.....	74	-4	Southern Plateau.....	48	-2
West Gulf.....	72	-3	Middle Plateau.....	67	-2
Ohio Valley and Tennessee.....	75	-3	Northern Plateau.....	80	-1
Lower Lake.....	80	+2	North Pacific Coast.....	88	+1
Upper Lake.....	84	+2	Middle Pacific Coast.....	81	-3
North Dakota.....	80	+1	South Pacific Coast.....	71	-3
Upper Mississippi.....	79	+1			

WIND.

The maximum wind velocity at each Weather Bureau station for a period of five minutes is given in Table I, which

also gives the altitude of Weather Bureau anemometers above ground.

Following are the velocities of 50 miles and over per hour registered during the month:

Maximum wind velocities.

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
Atlantic City, N. J.	19	60	nw.	Nantucket, Mass.	26	56	n.
Block Island, R. I.	3	55	nw.	New York, N. Y.	12	58	nw.
Do.	18	60	nw.	Do.	18	51	nw.
Do.	25	53	n.	Do.	19	72	nw.
Do.	26	58	n.	Do.	23	54	nw.
Buffalo, N. Y.	16	64	w.	Do.	29	52	nw.
Cape Henry, Va.	25	51	nw.	Point Reyes Light, Cal.	24	72	nw.
Carson City, Nev.	2	61	sw.	Port Huron, Mich.	16	50	w.
Do.	3	58	sw.	Portland, Oreg.	12	52	s.
Cheyenne, Wyo.	13	52	nw.	Sacramento, Cal.	8	60	se.
Chicago, Ill.	16	52	w.	Do.	4	54	se.
Do.	20	53	s.	San Francisco, Cal.	3	57	se.
Cleveland, Ohio	19	60	nw.	Sioux City, Iowa	8	54	nw.
Hatteras, N. C.	25	56	nw.	Do.	15	50	nw.
Miles City, Mont.	15	60	nw.	Do.	24	50	nw.
Milwaukee, Wis.	9	50	ne.	Valentine, Nebr.	15	58	nw.
Mount Tamalpais, Cal.	24	54	nw.	Williston, N. Dak.	16	60	n.
Do.	25	53	nw.	Winnemucca, Nev.	3	50	s.
Do.	31	53	nw.	Do.	4	53	s.
Nantucket, Mass.	25	55	n.				

ATMOSPHERIC ELECTRICITY.

Numerical statistics relative to auroras and thunderstorms are given in Table IV, which shows the number of stations from which meteorological reports were received, and the number of such stations reporting thunderstorms (T) and auroras (A) in each State and on each day of the month, respectively.

Thunderstorms.—Reports of 210 thunderstorms were received during the current month as against 266 in 1900 and 261 during the preceding month.

The dates on which the number of reports of thunderstorms for the whole country were most numerous were: 22d, 28; 23d, 35; 24th, 31.

Reports were most numerous from: Missouri, 36; Louisiana and West Virginia, 14.

Auroras.—The evenings on which bright moonlight must have interfered with observations of faint auroras are assumed to be the four preceding and following the date of full moon, viz, December 31, 1900, to January 8, 1901.

In Canada.—Auroras were reported as follows: Quebec, 22d; Swift Current, 21st, 22d; Banff, 7th; Prince Albert, 21st; Battleford, 21st, 22d, 23d, 24th.

DESCRIPTION OF TABLES AND CHARTS.

By ALFRED J. HENRY, Professor of Meteorology.

Table I gives, for about 145 Weather Bureau stations making two observations daily and for about 25 others making only one observation, the data ordinarily needed for climatological studies, viz, the monthly mean pressure, the monthly means and extremes of temperature, the average conditions as to moisture, cloudiness, movement of the wind, and the departures from normals in the case of pressure, temperature, and precipitation, the total depth of snowfall, and the mean wet-bulb temperatures. The altitudes of the instruments above ground are also given.

Table II gives, for about 2,700 stations occupied by voluntary observers, the highest maximum and the lowest minimum temperatures, the mean temperature deduced from the average of all the daily maxima and minima, or other readings, as indicated by the numeral following the name of the station; the total monthly precipitation, and the total depth in inches of any snow that may have fallen. When the spaces in the snow column are left blank it indicates that no snow has fallen, but when it is possible that there may have been snow of which no record has been made, that fact is indicated by leaders, thus (. . .).

Table III gives, for all stations that make observations at 8 a. m. and 8 p. m., the four component directions and the resultant directions based on these two observations only and without considering the velocity of the wind. The total movement for the whole month, as read from the dial of the Robinson anemometer, is given for each station in Table I. By adding the four components for the stations comprised in any geographical division the average resultant direction for that division can be obtained.

Table IV gives the total number of stations in each State from which meteorological reports of any kind have been received, and the number of such stations reporting thunderstorms (T) and auroras (A) on each day of the current month.

Table V gives a record of rains whose intensity at some period of the storm's continuance equaled or exceeded the following rates:

Duration, minutes..	5	10	15	20	25	30	35	40	45	50	60	80	100	120
Rates pr. hr. (ins.)..	3.00	1.80	1.40	1.20	1.08	1.00	0.94	0.90	0.86	0.84	0.75	0.60	0.54	0.50

In the northern part of the United States, especially in the colder months of the year, rains of the intensities shown in the above table seldom occur. In all cases where no storm of sufficient intensity to entitle it to a place in the full table has occurred, the greatest rainfall of any single storm has been given, also the greatest hourly fall during that storm.

Table VI gives, for about 30 stations furnished by the Canadian Meteorological Service, Prof. R. F. Stupart, director, the means of pressure and temperature, total precipitation and depth of snowfall, and the respective departures from normal values, except in the case of snowfall.

Table XI gives the heights of rivers referred to zeros of gages.

NOTES EXPLANATORY OF THE CHARTS.

Chart I, tracks of centers of high areas, and Chart II, tracks of centers of low areas, are constructed in the same way. The roman numerals show number and chronological order of highs (Chart I) and lows (Chart II). The figures within the circles show the days of the month; the letters *a* and *p* indicate, respectively, the 8 a. m. and 8 p. m., seventy-fifth meridian time, observations. Within each circle is also given (Chart I) the highest barometric reading and (Chart II) the lowest pressure at or near the center at that time.

Chart III.—Total precipitation. The scale of shades showing the depth of rainfall is given on the chart itself. For isolated stations the rainfall is given in inches and tenths, when appreciable; otherwise, a "trace" is indicated by a capital T, and no rain at all, by 0.0.

Chart IV.—Sea-level pressure, temperature, and resultant surface winds. The wind directions on this Chart are the computed resultants of observations at 8 a. m. and 8 p. m., daily; the resultant duration is shown by figures attached to each arrow. The temperatures are the means of daily maxima and minima and are reduced to sea level. The pressures are the means of 8 a. m. and 8 p. m. observations, daily, and are reduced to sea level and to standard gravity. The reduction for 30 inches of the mercurial barometer, as for-